COMPLETE LISTING OF CLAIMS

IN ASCENDING ORDER WITH STATUS INDICATOR

1. (Currently amended) A device, comprising:

a substrate of a semiconductor material;

an array of sensing pixels fabricated over said substrate, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel, wherein said sensing pixels are formed of multiple pixel layers; and

an optical mask layer formed over said substrate in an optical path of the input radiation, said optical mask layer having a plurality of optical holographic elements to modify a property of the input radiation prior to detection by said sensing pixels, and wherein at least a portion of said multiple pixel layers is formed over said optical mask layer.

2. (Currently amended) The device as in claim ~~1~~6, wherein said sensing pixels are formed of multiple pixel layers fabricated on said substrate, and wherein said optical mask layer is formed atop of said multiple pixel layers.

3. (Currently amended) The device as in claim 1, wherein said ~~sensing pixels are formed of~~ multiple pixel layers forming said sensing pixels are fabricated on said substrate, and

wherein said optical mask layer is between said multiple pixel layers and said substrate.

4. (Currently amended) The device as in claim 1, wherein multiple pixel layers forming said sensing pixels ~~are formed of~~include a first set of contiguous multiple pixel layers and a second set of contiguous pixel layers fabricated on said substrate, and wherein said optical mask layer is formed between said first set and said second set.

5. (Original) The device as in claim 1, wherein each optical holographic element focuses the input radiation to a corresponding sensing pixel underneath said each optical holographic element.

6. (Currently amended) A device, comprising:

a substrate of a semiconductor material;

an array of sensing pixels fabricated over said substrate, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel; and

~~6.~~an optical mask layer formed over said substrate in an optical path of the input radiation, said optical mask layer having a plurality of optical holographic elements to modify a property of the input radiation prior to detection by said sensing pixels~~The device as in claim 1~~, wherein each optical holographic

element selectively separates one color in the input radiation from another different color in the input radiation.

7. (Original) The device as in claim 1, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

8. (Original) The device as in claim 1, wherein each optical holographic element spatially covers only one sensing pixel.

9. (Original) The device as in claim 1, wherein each optical holographic element spatially covers at least two adjacent sensing pixels.

10. (Original) The device as in claim 1, wherein each optical holographic element includes a first hologram that focuses a beam and a second hologram that spectrally filters the same beam.

11. (Original) The device as in claim 1, wherein each holographic optical element is optically absorptive.

12. (Original) The device as in claim 1, wherein each holographic optical element is optically reflective.

13. (Original) The device as in claim 1, wherein each holographic optical element is optically refractive or diffractive.

14. (Original) A device, comprising:

a substrate of a semiconductor material;

a plurality of pixel layers formed over said substrate and patterned to define an array of sensing pixels, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel;

a first optical mask layer formed over said substrate in an optical path of the input radiation, said first optical mask layer having a plurality of optical holographic elements to optically interact with the input radiation; and

a second optical mask layer formed between said first optical mask layer and said substrate, said second optical mask layer separated from said first optical m ask layer by a set of contiguous pixel layers and having a plurality of optical holographic elements to optically interact with the input radiation that pass through said first optical mask layer.

15. (Original) The device as in claim 14, wherein each optical holographic element in said first and said second optical mask layers has a hologram that focuses received radiation.

16. (Previously Presented) The device as in claim 14, wherein each optical holographic element in said first optical

mask layer has a hologram that focuses received radiation and each optical holographic element in said second optical mask layer has a hologram that separates one color from another different color in the input radiation.

17. (Original) The device as in claim 14, wherein said second optical mask layer is formed between said pixel layers and said substrate, and said first optical mask layer is formed atop of said pixel layers.

18. (Original) The device as in claim 14, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

19. (New) The device as in claim 6, wherein said sensing pixels are formed of multiple pixel layers fabricated on said substrate, and wherein said optical mask layer is between said multiple pixel layers and said substrate.

20. (New) The device as in claim 6, wherein said sensing pixels are formed of a first set of contiguous multiple pixel layers and a second set of contiguous pixel layers fabricated on said substrate, and wherein said optical mask layer is formed between said first set and said second set.

21. (New) The device as in claim 6, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

22. (New) The device as in claim 6, wherein each optical holographic element spatially covers only one sensing pixel.

23. (New) The device as in claim 6, wherein each optical holographic element spatially covers at least two adjacent sensing pixels.

24. (New) The device as in claim 1, wherein each optical holographic element selectively separates one color in the input radiation from another different color in the input radiation.

25. (New) A device, comprising:

a substrate of a semiconductor material;

an array of sensing pixels fabricated over said substrate, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel; and

an optical mask layer formed over said substrate in an optical path of the input radiation, said optical mask layer having a plurality of optical holographic elements to modify a property of the input radiation prior to detection by said sensing pixels, wherein each optical holographic element includes a first

hologram that focuses a beam and a second hologram that spectrally filters the same beam.

26. (New) The device as in claim 25, wherein said sensing pixels are formed of multiple pixel layers fabricated on said substrate, and wherein said optical mask layer is between said multiple pixel layers and said substrate.

27. (New) The device as in claim 25, wherein said sensing pixels are formed of a first set of contiguous multiple pixel layers and a second set of contiguous pixel layers fabricated on said substrate, and wherein said optical mask layer is formed between said first set and said second set.

28. (New) The device as in claim 25, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

29. (New) The device as in claim 25, wherein each optical holographic element spatially covers only one sensing pixel.

30. (New) The device as in claim 25, wherein each optical holographic element spatially covers at least two adjacent sensing pixels.